What is claimed is:

1. An apparatus for adaptively modulating signal in a MIMO system having a layered space-time architecture based detector, the apparatus comprising:

a bit and power allocation information calculator for deciding an equivalent channel gain in a reverse order of Vertical-Bell laboratories Space Time (V-BLAST) based on MIMO channel information feedbacked from a receiver and determining the number of bits and transmission power to be transmitted to each transmitting antenna by using the equivalent channel gain; and

adaptive modulation mean for modulating signal of each layer with corresponding modulation method based on the determined number of bits, controlling the transmitting power and transmitting the adaptively modulated signal through each transmitting antenna.

2. The apparatus as recited in claim 1, wherein the transmitter detects and modulates signals in a reverse order of a V-BLAST.

3. The apparatus as recited in claim 1, wherein the receiver transmits identical adaptive modulation information with the modulation method and transmitting power instead of feedbacking the MIMO channel information.

4. The apparatus as recited in claim 1, wherein the bit and power allocation information calculation mean determines an equivalent channel gain in the reverse order of V-BLAST and calculates the number of bit information and corresponding transmitting power at each layer by using the equivalent channel gain in a greedy algorithm instead of using channel gain.

5. An apparatus for adaptively demodulating signal in a MIMO system having a layered space-time architecture based detector, the apparatus comprising:

MIMO channel estimation means for estimating MIMO channel from a signal received through each receiving antenna;

a bit and power allocation information calculator for determining an equivalent channel gain in reverse order of Vertical-Bell laboratories Space Time (V-BLAST) based on MIMO channel information from the MIMO channel estimation means and determining the number of bits to be transmitted from each transmitting antenna by using the equivalent channel gain; and

adaptive demodulation means for demodulating signal of each layer with corresponding modulation method based on the determined number of bits and the MIMO channel information.

6. An apparatus for adaptively modulating and

demodulating signals in MIMO system using multiple antennas at transmitter and receivers, the apparatus comprising:

an adaptive modulation means for adaptively modulating signals in order to transmit the modulated signal after determining an equivalent channel gain in a reverse order of a vertical-bell laboratories space time and determining the number of bits and transmitting power based on the determined equivalent channel gain; and

adaptive demodulation means for detecting and adaptively demodulating received signals in reverse order of V-BLAST.

7. The apparatus as recited in claim 6, wherein the adaptive demodulation means feedbacks the MIMO channel information to the modulation means or transmits identical adaptive modulation information including the modulation method and transmitting power instead of the MIMO channel information.

8. The apparatus as recited in claim 7, wherein the apparatus has (the number of subcarriers) x (the number of transmission antennas) of equivalent channel gains and determines the number of bits and transmitting power to be transmitted through each transmission antennas in a MIMO-OFDM system having a layered space-time architecture detector.

9. The apparatus as recited in claim 6, wherein the apparatus independently detects and demodulates signals per each subcarrier by determining the number of bits and transmitting power to be transmitted through each transmitting antenna per each subcarrier in a MIMO OFDM system having a layered space-time architecture detector.

10. A method for adaptive modulating signals in a MIMO system using multiple antennas in a receiver and transmitter, the method comprising the steps of:

a) determining equivalent channel gain in a reverse order of V-BLAST at transmitter based on information feedbacked from the receivers; and

b) adaptively modulating signals by determining the number of bits and corresponding transmitting power to be transmitted through each layer by using the equivalent channel gain in a greedy algorithm instead of using subcarrier.

11. The method as recited in claim 10, wherein the transmitter detects and modulates signals in a reverse order of a V-BLAST.

12. The method as recited in claim 11, wherein the step a) includes the steps of:

a-1) initializing an antenna index set;

a-2) nulling layers in an order of layer having a

smallest equivalent channel gain and modifying the antenna index set or a channel matrix based on a result of nulling layers;

a-3) repeatedly performing the step a-2) as many as the number of antennas; and

a-4) deciding the equivalent channel gain of each antenna layer based on a result of the step a-3).

13. The method as recited in the claim 12, wherein the step a-2) includes the steps of:

a-2-1) computing an pseudo-inverse matrix of channel matrix;

a-2-2) computing square root of norm of nulling vector for deciding a nulling layer;

a-2-3) selecting a layer having a biggest norm of nulling vectors among layers of computing results from the step a-2-2); and

a-2-4) nulling the selected layer and eliminating the selected layer from the antenna index set.

14. The method as recited in claim 10, the step a) includes the steps of:

a-a) initializing an antenna index set;

a-b) nulling layers in an order of layer having a smallest equivalent channel gain and modifying the antenna index set or a channel matrix based on a result of nulling layers;

a-c) reputedly performing the step a-b) as many as the number of antennas;

a-d) deciding the equivalent channel gain of each antenna layer based on a result of the step a-c); and

a-e) deciding the equivalent channel gain by reputedly performing the step a), the step b), the step a-a) and the step a-c).

15. The method as recited in the claim 14, the number of bit transmitting to each antenna and a transmitting power are decided by performing a greedy algorithm based on the decided equivalent channel gain computed from the step a-e) in the step b).

16. The method as recited in claim 10, wherein the step a), in a case there are preset data bits of the system and data bits allocated to each subcarrier are identical, includes the steps of:

a-I) initializing an antenna index set according to a subcarrier;

a-II) nulling layers in an order of layer having a smallest equivalent channel gain and modifying the antenna index set or a channel matrix based on a result of nulling layers for the subcarrier;

a-III) repeatedly performing the step a-II) as many as the number of antennas for the subcarrier; and

a-IV) deciding the equivalent channel gain of each

antenna layer based on a result of the step a-III).

17. The method as recited in claim 16, wherein the step a-II) includes the steps of:

a-II-1) performing a greedy algorithm from the equivalent channel gain decided to one of the subcarrier in the step of a-IV) and deciding the number of bits transmitting through an antenna according to the one of carrier waves and transmitting power; and

a-II-2) deciding identical number of bits and transmitting power which are decided in the step a-II-1) for all other sub carrier waves.

18. A method for adaptively demodulating in a multi input and multi output system, the method comprising the steps of:

a) estimating a channel from a signal received at each receiving antenna;

b) deciding an equivalent channel gain in a reverse order of a vertical-bell laboratories space time (V-BLAST) based on the channel information; and

c) detecting and adaptively demodulating by deciding the number of bits based on the equivalent channel gain.

19. A computer readable recoding medium storing instruction for executing a method for adaptive modulation, the method comprising the steps of:

a) at a transmitter, deciding an equivalent channel gain in a reverse order of V-BLAST based on a feedback information from a receiver; and

b) at the transmitter, deciding the number of bit transmitting through each layer (transmitting antenna) and transmitting power based on the equivalent channel gain computed at the step a).

20. A computer readable recoding medium storing instructions for executing a method for adaptively demodulating signals, the method comprising the steps of:

a) estimating a channel from a signal received from each receiving antenna;

b) deciding an equivalent channel gain in a reverse order of V-BLAST based on the channel information; and

c) detecting and adaptively demodulating by deciding the number bits transmitted from the each transmitting antenna based on the equivalent channel gain.